Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-7. (Canceled)

8. (Previously Presented) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock.

9. (Previously Presented) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock, and

wherein directly deriving the second QP value from the first QP value includes applying a bias value to the first QP value.

10. (Previously Presented) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

applying the first and second QP values; and

compressing the color video image, after application of the first and second QP values, to a compressed output image.

11. (Original) The method of claim 10, further including decompressing the compressed output image using the first and second QP values to obtain an uncompressed video image.

12. (Previously Presented) A method comprising:

in a YUV video image compression system, utilizing macroblocks and quantization parameters during compression, a variable quantization step size and a quantization parameter (QP) representing a size of a step, where an increase in QP corresponds to a larger quantization step size;

selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and

in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for said at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, and wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock.

13. (Previously Presented) A method comprising:

in a YUV video image compression system, utilizing macroblocks and quantization parameters during compression, a variable quantization step size and a quantization parameter (QP) representing a size of a step, where an increase in QP corresponds to a larger quantization step size;

selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and

in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for said at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock, and

wherein for at least one of said direct derivation or relationship the second QP value is determined by applying a bias value to the first QP value.

14. (Previously Presented) A method comprising:

in a YUV video image compression system, utilizing macroblocks and quantization parameters during compression, a variable quantization step size and a quantization parameter (QP) representing a size of a step, where an increase in QP corresponds to a larger quantization step size;

selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for said at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, and wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock;

applying the first and second QP values; and

compressing the color video image, after application of the first and second QP values, to a compressed output image.

15. (Original) The method of claim 14, further including decompressing the compressed output image using the first and second QP values to obtain an uncompressed video image.

16-36. (Canceled)

37. (Previously Presented) A computer program, stored on a computer-readable medium, for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size, the computer program comprising instructions for causing a computer to:

utilize a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilize a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock.

38. (Previously Presented) A computer program, stored on a computer-readable medium, for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size, the computer program comprising instructions for causing a computer to:

utilize a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilize a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock, and

wherein directly deriving the second QP value from the first QP value includes applying a bias value to the first QP value.

39. (Previously Presented) A computer program, stored on a computer-readable medium, for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size, the computer program comprising instructions for causing a computer to:

utilize a first QP value for a Y luminance channel of the color video image for a first macroblock;

utilize a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

apply the first and second QP values; and

compress the color video image, after application of the first and second QP values, to a compressed output image.

40. (Original) The computer program of claim 39, further including instructions for causing a computer to decompress the compressed output image using the first and second QP values to obtain an uncompressed video image.

41. (Previously Presented) A computer program, stored on a computer-readable medium, including instructions operative to cause a computer to:

in a YUV video image compression system, utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step, where an increase in QP corresponds to a larger quantization step size;

select at least one of reducing chroma noise during compression of a color video image and achieve higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilize a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilize a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and in response to selecting achieving higher compression,

utilize the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilize the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, and wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock.

42. (Previously Presented) A computer program, stored on a computer-readable medium, including instructions operative to cause a computer to:

in a YUV video image compression system, utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step, where an increase in QP corresponds to a larger quantization step size;

select at least one of reducing chroma noise during compression of a color video image and achieve higher compression during compression of the color video image;

in response to selecting reducing chroma noise,

utilize a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilize a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and in response to selecting achieving higher compression,

utilize the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilize the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock, and

wherein for at least one of said direct derivation or relationship, the second QP value is determined by applying a bias value to the first QP value.

43. (Previously Presented) A computer program, stored on a computer-readable medium, including instructions operative to cause a computer to:

in a YUV video image compression system, utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter

(QP) to represent a size of a step, where an increase in QP corresponds to a larger quantization step size;

select at least one of reducing chroma noise during compression of a color video image and achieve higher compression during compression of the color video image; in response to selecting reducing chroma noise,

utilize a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilize a second QP value for at least one of. a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

in response to selecting achieving higher compression,

utilize the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilize the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, and wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock;

apply the first and second QP values; and

compress the color video image, after application of the first and second QP values, to a compressed output image.

44. (Original) The computer program of claim 43, further including instructions for causing a computer to decompress the compressed output image using the first and second QP values to obtain an uncompressed video image.

45-65. (Canceled)

66. (Previously Presented) A system for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, including:

means for utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

means for utilizing a second QP value for at least one of the U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and

means for applying the first and second QP values during compression of the color video image.

67. (Previously Presented) A system for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, including:

means for utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

means for utilizing a second QP value for at least one of the U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at

least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock, and

wherein for said direct derivation or relationship, the second QP value is determined by applying a bias value to the first QP value; and

means for applying the first and second QP values during compression of the color video image.

68. (Previously Presented) A system for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, including:

means for utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock;

means for utilizing a second QP value for at least one of the U and V color channels of the color video image for said first macroblock, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

means for applying the first and second QP values during compression of the color video image; and

means for compressing the color video image, after application of the first and second QP values, to a compressed output image.

69. (Original) The system of claim 68, further including means for decompressing the compressed output image using the first and second QP values to obtain an uncompressed video image.

70. (Previously Presented) A YUV video image compression system configured to utilize macroblocks and quantization parameters during compression, a variable quantization step size, and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, the system including:

means for selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

means for, in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and

means for, in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, and wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock; and

means for applying the first and second QP values during compression of the color video image.

71. (Currently Amended) A YUV video image compression system configured to utilize macroblocks and quantization parameters during compression, a variable quantization

step size, and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, the system including:

means for selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

means for, in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock; and

means for, in response to selecting achieving higher compression,

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, ~~wherein for said first macroblock,~~ wherein said second QP value is dependent only upon a relationship to the first QP value, wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock, and

wherein for at least one of said direct derivation or relationship , the second QP value is determined by applying a bias value to the first QP value; and

means for applying the first and second QP values during compression of the color video image.

72. (Previously Presented) A YUV video image compression system configured to utilize macroblocks and quantization parameters during compression, a variable quantization

step size, and a quantization parameter (QP) to represent a size of a step where an increase in QP corresponds to a larger quantization step size, the system including:

means for selecting at least one of reducing chroma noise during compression of a color video image and achieving higher compression during compression of the color video image;

means for, in response to selecting reducing chroma noise,

utilizing a first QP value for a Y luminance channel of a first macroblock of the color video image, and

utilizing a second QP value for at least one of a U color channel and a V color channel of said first macroblock of the color video image, wherein said second QP value is directly derived from the first QP value, and the second QP value is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock;

means for, in response to selecting achieving higher

utilizing the first QP value for the Y luminance channel of said first macroblock of the color video image, and

utilizing the second QP value for at least one of the U and V color channels of said first macroblock of the color video image, wherein said second QP value is dependent only upon a relationship to the first QP value, and wherein the relationship comprises a property that the second QP value is higher than the first QP value so that said at least one of the U and V color channels has coarser quantization resolution than the Y luminance channel for said first macroblock;

means for applying the first and second QP values during compression of the color video image; and

means for compressing the color video image, after application of the first and second QP values, to a compressed output image.

73. (Original) The system of claim 72, further including means for decompressing the compressed output image using the first and second QP values to obtain an uncompressed video.

74-87. (Canceled).

88. (Previously Presented) The method of claim 8 or 12, wherein directly deriving the second QP value from the first QP value includes accessing a lookup table comprising a plurality of QP values.

89. (Previously Presented) The computer program of claim 37 or 41, wherein directly deriving the second QP value from the first QP value includes accessing a lookup table comprising a plurality of QP values.

90. (Previously Presented) The system of claim 66 or 70, wherein directly deriving the second QP value from the first QP value includes accessing a lookup table comprising a plurality of QP values.

91. (Previously Presented) The method of claim 8, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

92. (Previously Presented) The method of claim 12, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

93. (Previously Presented) The computer program of claim 37, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

94. (Previously Presented) The computer program of claim 41, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

95. (Previously Presented) The system of claim 66, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

96. (Previously Presented) The system of claim 70, wherein the direct derivation is independent of pixel values for any of the color channels or the luminance channel.

97. (Previously Presented) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is derived independently of pixel values for any of the color channels or the luminance channel, and the second QP value for said first macroblock is lower than the first QP value so that said at least one of the U and V color channels has finer quantization resolution than the Y luminance channel for said first macroblock.

98. (Previously Presented) The method of claim 97, wherein deriving the second QP value independently of pixel values for any of the color channels or the luminance channel includes applying a bias value to the first QP value.

99. (Previously Presented) The method of claim 98, wherein applying the bias value to the first QP value comprises adding the bias value to the first QP value or subtracting the bias value from the first QP value.

100. (Previously Presented) The method of claim 97, wherein deriving the second QP value independently of pixel values for any of the color channels or the luminance channel includes accessing a lookup table comprising a plurality of QP values.

101. (New) The method of claim 8, wherein directly deriving the second QP value from the first QP value includes:

(a) applying a bias value to the first QP value to provide a first intermediate result;

(b) comparing the first intermediate result to a predetermined value; and

(c) when the first intermediate result falls below the predetermined value, setting the first intermediate result equal to the predetermined value.

102. (New) The method of claim 97, wherein directly deriving the second QP value from the first QP value further includes applying a non-linear look-up table to the first intermediate result.

103. (New) The method of claim 98, wherein a spatial resolution of the Y luminance channel is greater than a spatial resolution of the U and the V color channels.

104. (New) The method of claim 99, wherein the step of applying the bias value to the first QP value to provide the first intermediate result comprises subtracting a constant value from the first QP value.

105. (New) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is determined by application of at least the following steps:

(a) applying a bias value to the first QP value to provide a first intermediate result;

(b) comparing the first intermediate result to a predetermined value; and

(c) when the first intermediate result falls below the predetermined value, setting the first intermediate result equal to the predetermined value.

106. (New) The method of claim 105, wherein the step of utilizing the second QP value for at least one of the U and V color channels of the color video image for said first macroblock comprises utilizing the second QP value for the U color channel and wherein the method further comprises the step of:

utilizing a third QP value for the V color channel of the color video image for said first macroblock, wherein said third QP value is determined by application of at least the following steps:

(a) applying a bias value to the second QP value to provide a second intermediate result;

(b) comparing the second intermediate result to the predetermined value;

(c) when the second intermediate result falls below the predetermined value, setting the second intermediate result equal to the predetermined value.

107. (New) The method of claim 105, wherein the step of utilizing the second QP value further comprises applying a non-linear look-up table to the first intermediate result.

108. (New) The method of claim 107, wherein a spatial resolution of the Y luminance channel is greater than a spatial resolution of the U and the V color channels.

109. (New) The method of claim 108, wherein the second QP value is less than the first QP value.

110. (New) The method of claim 106, wherein the step of applying the bias value to the second QP value to provide the second intermediate result comprises subtracting a constant value from the second QP value.

111. (New) A method for reducing chroma noise during compression of a color video image in a YUV video image compression system using macroblocks and quantization parameters during compression, including:

utilizing a variable quantization step size and a quantization parameter (QP) to represent a size of a step where an increase in the QP corresponds to a larger quantization step size;

utilizing a first QP value for a Y luminance channel of the color video image for a first macroblock; and

utilizing a second QP value for at least one of U and V color channels of the color video image for said first macroblock, wherein said second QP value is determined by applying a bias value to the first QP value to produce a first intermediate result and then applying a limit function to the first intermediate result.

112. (New) The method of claim 111, wherein a spatial resolution of the Y luminance channel is greater than a spatial resolution of the U and the V color channels.

113. (New) The method of claim 112, wherein the step of utilizing the second QP value further comprises applying a non-linear look-up table to the first intermediate result.

114. (New) The method of claim 113, wherein the second QP value is less than the first QP value.